



Monitoring report form

(Version 04.0)

MONITORING REPORT

Title of the project activity	Enercon Wind Farms in Karnataka Bundled Project – 30.40 MW
Reference number of the project activity	1291
Version number of the monitoring report	2
Completion date of the monitoring report	27/09/2014
Registration date of the project activity	18/03/2010
Monitoring period number and duration of this monitoring period	4 th Monitoring Period 01/10/2012-31/03/2014 (including both the days)
Project participant(s)	Wind World (India) Ltd.
Host Party(ies)	India
Sectoral scope and selected methodology(ies), and where applicable, applied standardized baseline(s)	Sectoral Scope 1 Energy industries (renewable/ non-renewable sources). 'Consolidated baseline methodology for grid-connected electricity generation from renewable sources', ACM0002, Version 06 and 'consolidated monitoring methodology for grid-connected electricity generation from renewable sources', ACM0002, Version 06
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	98,661 tCO ₂
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	69,405 tCO ₂
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	8,127 tCO ₂
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	61,278 tCO ₂

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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(a) *Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks;*

The purpose of the project activity is to utilize renewable wind energy for generation of electricity. The project activity replaces anthropogenic emissions of greenhouse gases (GHG's) into the atmosphere, which is estimated to be approximately 69,405 tCO₂e for this monitoring period, by displacing the equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants and future capacity expansions connected to the grid. In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the Southern grid, which are/ will be predominantly based on fossil fuels. Whereas the electricity generation from operation of Wind Energy Convertors (WEC's) is emission free.

The Project harnesses renewable resources in the region, and thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development.

Wind World (India) Ltd ("Wind World") is equipment supplier and the operations and maintenance contractor for the Project. The generated electricity is supplied to Karnataka Power Transmission Company Ltd

("KPTCL")/ Bangalore Electricity Supply Company Ltd ("BESCOM") / Hubli Electricity Supply Company Ltd ("HESCOM") under long-term power purchase agreements (PPA). Enercon Wind Farm (Chitradurga) Ltd. is owned by Wind World (India) Ltd. and Wind World and the rest of the projects are owned by Wind World's customers. The details of the Projects are as under:

1. Enercon Wind Farms (Chitradurga) Ltd: 8.80 MW
2. Panama Business Centre: 1.60 MW
3. Sameer Ladkat: 1.60 MW
4. Elpro International: 0.80 MW
5. Gautam Ladkat: 0.80 MW
6. Panama Infrastructure: 1.60 MW
7. Sameer Ladkat: 0.80 MW
8. Steelfab Offshore 0.80 MW
9. MK Agrotech Private Ltd: 1.60 MW
10. Srinivas Sirigeri: 0.80 MW
11. Dempo Industries: 0.80 MW
12. Desai Brothers: 0.80 MW
13. Dewanchand Ramsaran: 0.80 MW
14. Abhilash Garments & Estates (P) Ltd: 0.80 MW
15. Prasad Global Solutions: 1.60 MW
16. Gangadhar Narsingdas Agarwal: 4.00 MW
17. Siddaganga Oil Extractions Ltd.: 1.60 MW
18. Power Link System Private Limited: 0.80 MW

The first machine under the project activity was commissioned on 29/03/2006 and the last machine under the project activity was commissioned on 29/12/2006. The expected operational lifetime of the project is for 20 years. The total emission reductions achieved under this monitoring period (01/10/2012 to 31/03/2014) is 69,405 tCO₂.

(b) *Brief description of the installed technology and equipments;*

The project activity involves supply, erection, commissioning and operation of 38 machines of rated capacity 800 KW each. The machines are Wind World E-53 make. Wind World (India) Ltd (WWIL) is the turbine supplier and is the operations and maintenance contractor.

(c) *Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);*

The WECs under the project activity were commissioned between 29/03/2006 and 29/12/2006. The expected operational lifetime of the project is for 20 years. The project activity was registered as CDM project on 18/03/2010. The operation period is from 01/10/2012 to 31/03/2014.

(d) *Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period.*

The total emission reductions achieved under this monitoring period (01/10/2012 to 31/03/2014) is 69,405 tCO₂.

A.2. Location of project activity

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(a) Host Party(ies);
India

(b) Region/State/Province, etc.;
Southern Region/Karnataka State

(c) City/Town/Community, etc.;
The Project is spread across villages of Gadag & Chitradurga District of Karnataka state in India.

(d) Physical/ Geographical location.

The Project is located in Gadag & Chitradurga district in the Indian State of Karnataka. Approximate distance of the project activity from Bangalore by road is 200 km. The nearest major railway station as well as airport is Bangalore. The longitude and latitude details of WECs are given below:

Sr. No.	Project Owner	Unique Identification No.	Loc. No.	Latitude			Longitude		
				Deg.	Min.	Sec.	Deg.	Min.	Sec.
1	Enercon Wind Farms (Chitradurga) Ltd.	EWCLA-01	1	14	2	45.2	76	28	8.3
2		EWCLA-02	2	14	2	49	76	28	6.3
3		EWCLA-03	3	14	2	52.6	76	28	5
4		EWCLA-04	4	14	2	56.7	76	28	4.4
5		EWCLA-05	5	14	3	0.6	76	28	3.8
6		EWCLA-06	6	14	3	4.4	76	28	3
7		EWCLA-07	7	14	3	8.8	76	28	2.4
8		EWCLA-08	8	14	3	14.6	76	28	1.2
9		EWCLA-09	9	14	3	18.4	76	28	0.3
10		EWCLA-10	10	14	3	22.1	76	27	59.2
11		EWCLA-11	11	14	3	26	76	27	58.6
12	Panama Business Centre	PBCGH2-01	65	13	57	23.5	76	24	55
13		PBCGH2-02	66	13	57	20	76	24	54.6
14	Sameer Ladkat	BMLGH2-01	67	13	57	16.3	76	24	55.9
15		BMLGH2-02	68	13	57	12.9	76	24	57.5
16	Elpro International	EILGH2-01	59	13	58	50.7	76	25	24.9
17	Gautam Ladkat	GLGH2-01	69	13	57	10.8	76	25	0.9
18	Panama Infrastructure	PIPPGH2-01	43	13	59	28.2	76	23	46.2
19		PIPPGH2-02	44	13	59	28.5	76	23	50.8
20	Sameer Ladkat	SLGH2-01	45	13	59	22.4	76	23	52.6
21	Steelfab Offshore	SFOGH2-01	71	13	57	3.6	76	25	4.9
22	MK Agrotech Private Ltd.	MKAGH2-01	61	13	58	44.3	76	25	26.3
23		MKAGH2-02	62	13	58	40.9	76	25	28
24	Srinivas Sirigeri	SSHD-01	7	13	57	0.10	76	19	29.80
25	Dempo Industries	DIPLHD-01	6	13	57	4.30	76	19	28.20
26	Desai Brothers	DBLHD-01	1	13	59	27.70	76	18	45.70
27	Dewanchand Ramsaran	DRGH2-01	72	13	57	0	76	25	6.7
28	Abhilash Garments & Estates (P) Ltd.	AGEGA-01	11	15	8	57.30	75	38	38.20
29	Prasad Global Solutions	PGSGA-01	1	15	10	7.90	75	38	34.50
30		PGSGA-02	17	15	8	19.4	75	39	1.80
31	Gangadhar Narsingdas Agarwal	GNAGA-01	6	15	9	34.3	75	38	27.1
32		GNAGA-02	7	15	9	26.4	75	38	31.5
33		GNAGA-03	8	15	9	20.5	75	38	32
34		GNAGA-04	12	15	8	48.7	75	38	39.4
35		GNAGA-05	13	15	8	44.7	75	38	41
36	Siddaganga Oil Extractions Ltd.	SOEGA-01	14	15	8	40.3	75	38	44.3
37		SOEGA-02	15	15	8	36.5	75	38	46.8
38	Power Link System Private Limited	PLSHD-01	5	13	57	8.10	76	19	27.30

A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (Host)	Wind World (India) Ltd.	No

A.4. Reference of applied methodology and standardized baseline

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ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 6.0)

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

'consolidated monitoring methodology for grid-connected electricity generation from renewable sources', ACM0002, Version 06

A.5. Crediting period of project activity

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The length of the Crediting period of the project activity as per registered PDD is 10 years (Fixed). The crediting period start date is 18/03/2010 (from 18/03/2010 to 17/03/2020).

A.6. Contact information of responsible persons/ entities

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Provided in Appendix 1.

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

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The first machine under the project activity was commissioned on 29/03/2006 and last machine under the project activity was commissioned on 29/12/2006. The project activity consists of 38 machines (800 kWh) of Wind World make E-48 totalling to a capacity of 30.4 MW.

The commissioning date for all the WECs included in the project activity is given in the table below:

Sr. No.	Project Owner	Unique Identification No.	Loc. No.	Commissioning Date
1	Enercon Wind Farms (Chitradurga) Ltd.	EWCLA-01	1	06/05/2006
2		EWCLA-02	2	06/05/2006
3		EWCLA-03	3	06/05/2006
4		EWCLA-04	4	06/05/2006
5		EWCLA-05	5	06/05/2006
6		EWCLA-06	6	06/05/2006
7		EWCLA-07	7	31/03/2006
8		EWCLA-08	8	31/03/2006
9		EWCLA-09	9	31/03/2006
10		EWCLA-10	10	31/03/2006
11		EWCLA-11	11	31/03/2006
12	Panama Business Centre	PBCGH2-01	65	31/03/2006
13		PBCGH2-02	66	31/03/2006
14	Sameer Ladkat	BMLGH2-01	67	31/03/2006
15		BMLGH2-02	68	31/03/2006
16	Elpro International	EILGH2-01	59	31/03/2006

17	Gautam Ladkat	GLGH2-01	69	31/03/2006
18	Panama Infrastructure	PIPPGH2-01	43	31/03/2006
19		PIPPGH2-02	44	31/03/2006
20	Sameer Ladkat	SLGH2-01	45	31/03/2006
21	Steelfab Offshore	SFOGH2-01	71	31/03/2006
22	MK Agrotech Private Ltd.	MKAGH2-01	61	31/03/2006
23		MKAGH2-02	62	31/03/2006
24	Srinivas Sirigeri	SSHD-01	7	29/03/2006
25	Dempo Industries	DIPLHD-01	6	29/03/2006
26	Desai Brothers	DBLHD-01	1	29/03/2006
27	Dewanchand Ramsaran	DRGH2-01	72	31/03/2006
28	Abhilash Garments & Estates (P) Ltd.	AGEGA-01	11	29/12/2006
29	Prasad Global Solutions	PGSGA-01	1	29/12/2006
30		PGSGA-02	17	29/12/2006
31	Gangadhar Narsingdas Agarwal	GNAGA-01	6	29/12/2006
32		GNAGA-02	7	29/12/2006
33		GNAGA-03	8	29/12/2006
34		GNAGA-04	12	29/12/2006
35		GNAGA-05	13	29/12/2006
36	Siddaganga Oil Extractions Ltd.	SOEGA-01	14	31/03/2006
37		SOEGA-02	15	31/03/2006
38	Power Link System Private Limited	PLSHD-01	5	29/03/2006

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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Not Applicable

B.2.2. Corrections

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To indicate the village in which each of the Wind Energy Generator (WEG) is located, in accordance with the commissioning certificates & the actual geo-coordinate of the individual WEGs as per the actual site measurements has been reported in PDD Version 6 dated 16/04/2011.

B.2.3. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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Revision of monitoring plan has been successfully completed and approved by UNFCCC on 21/07/2011 for the project activity.

B.2.4. Changes to project design of registered project activity

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Ownership of one machine (0.8 MW) has been transferred from "R.K.Marbles" to "Power Link System Private Limited" which has been reported in PDD Version 6, dated 16/04/2011. Due to the demise of Sri Balasaheb Ladkat change of ownership has been taken place from Late Balasaheb Ladkat to his son Sameer Ladkat for a commissioned capacity of 1.6 MW (bearing Location No. 59 & 69, Unique Identification No. BMLGH2-01, BMLGH2-02)

B.2.5. Changes to start date of crediting period

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Not Applicable

B.2.6. Types of changes specific to afforestation or reforestation project activity

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Not Applicable

SECTION C. Description of monitoring system

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Approved monitoring methodology ACM0002 / Version 06 Sectoral Scope: 1, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where ex post determination of grid emission factor has been chosen

Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required.

There is dedicated main and check meters for each of the sub projects included in the project activity at 33 kV metering point. The feeders of 33 kV metering point are further connected to step up transformer at substation and subsequently to bulk meter at high voltage side of receiving substation.

The bulk meters are connected to machines of the project activity and the machines commissioned by the other project developers. The subprojects included in the project activity are connected to following four substations where the bulk meters are located:

Sr. No.	Name of Customer	Capacity (MW)	Wind World Sub-station	State Utility Sub-station
1	Enercon Wind Farms (Chitradurga) Ltd.	8.8	Wind World Sub-station at Imangala	Aiamangala, 66/11 kV KPTCL sub-station
2	Steelfab Offshore	0.8	GIM-II Sub-station at Gownalli	Hiriyur, 220/66/11 kV KPTCL sub-station
3	Dewanchand Ramsaran	0.8		
4	Elpro International	0.8		
5	Gautam Ladkat	0.8		
6	Sameer Ladkat	0.8		
7	Panama Business Centre	1.6		
8	Sameer Ladkat	1.6		
9	Panama Infrastructure	1.6		
10	MK Agrotech Private Ltd.	1.6	EP-II Sub-station at Nandana Hosuru	Ramagiri, 66/11 kV KPTCL substation
11	Srinivas Sirigeri	0.8		
12	Dempo Industries	0.8		
13	Power Link Systems Pvt. Ltd.	0.8		
14	Desai Brothers	0.8	Gadag Sub-station at Banikoppa	Dambal, 110/33/11 kV KPTCL sub-station.
15	Siddganga Oil Extraction	1.6		
16	Abhilash Garments	0.8		
17	Prasad Global Solution	1.6		
18	Gangadhar Narsingdas Agarwal	4.0		

Therefore in order to determine the net electricity supplied to the grid by the project at high voltage side of receiving substation, the state utility applies the transmission loss to the meter reading recorded at the 33 kV metering point. The transmission loss calculated by the state utility is endorsed / confirmed jointly by the representatives of Wind World and the state utility. The transmission loss applied to the project activity by the state utility is reflected in the JMR (Form B) for each sub project recorded at 33kV metering point. Net electricity supplied to the grid is calculated by applying transmission loss to the meter readings taken at 33 kV metering location for all the sub projects included in the project activity.

The procedure for calculation of transmission loss as given in the PPA is set-out below:

$$Z = \frac{(x_1+x_2+x_3...+x_n)-y}{(X_1+X_2+X_3...+X_n)} \times 100$$

The procedure for calculation of transmission loss as given in the PPA is set-out below:

$$Z = \frac{(x_1+x_2+x_3...+x_n)-Y}{(X_1+X_2+X_3...+X_n)} \times 100$$

Z = Percentage transmission loss for export incurred in transmission line between the meters located at 33 kV metering point (including the machines of the project activity and other project developers) and the meters located at high voltage side (bulk meter: main and check) of receiving sub-station.

Summation of meter readings at 33 kV metering points for all the project developers connected to receiving substation (including the machines of the project activity and other project developers) = $(X_1+X_2+X_3...+X_n)$

X_i = Energy Export Reading (X_i) noted at energy meter installed at 33kV metering point where i vary from 1 to n which represents the meters connected to project activity and other project developers.

$X_1, X_2, X_3, ... X_n$ are the meters that are installed at 33kV metering point (including the machines of the project activity and other project developers) and further connected to the receiving substation by internally connected lines.

Y = Energy Export Reading at bulk meter installed at high voltage side of transformer of the receiving sub-station

The Export Reading X_i is adjusted for transmission loss that is determined by the state utility and is applied directly to the JMR (Form B) for each sub project included in the project activity taken at 33 kV metering point. This can be checked from the JMR signed jointly by the representatives of Wind World and the state utility.

Transmission Loss in Export (T_E) = Transmission Loss (Z) * Energy Export at 33kV metering point (EG_{Export})

Empirical Formula for Energy Export after adjustment of transmission loss (Equation 1)

Net Energy Export for each of the sub project after adjustment of transmission loss = $EG_{Export} - \text{Transmission Loss } (T_E)$

The transmission loss in export is generally less than 5%. However in case of Energy Import, the state utility conservatively applies adjustment of 15% to the import values noted at 33 kV metering point.

Transmission Loss in Import (T_I) = 15% * Energy Import at 33kV metering point (EG_{Import})

Empirical Formula for Energy Import after adjustment of transmission loss (Equation 2)

Net Energy Import for each of the sub project after adjustment of transmission loss = $EG_{Import} + 15\% * EG_{Import} = 115\% * EG_{Import}$

Therefore Energy Supplied to Grid for each of the sub project after adjustment of transmission loss is difference of equation 1 and 2 as given in the JMR (Form B) signed jointly by Wind World and the state utility.

$EG_y \text{ (Sub project)} = EG_{Export} - 115\% * EG_{Import} - \text{Transmission Loss } (T_E)$

The Joint meter reading for each of the sub project noted at 33 KV metering location contains the following data:-

1. Electricity Export (EG_{Export})
2. Electricity Import (EG_{Import})
3. Transmission Loss (T_E) between 33 kV metering point and high voltage side of receiving substation
4. Net Electricity supplied to the Grid [$EG_{Export} - 115\% * EG_{Import} - T_E$]

JMR is signed by the representatives of Wind World and the state utility. The meter readings (both export and import), transmission loss and net electricity supplied to the grid are recorded in the JMR (33 KV metering point). Hence all these values are reproduced from the JMR for calculation of emission reductions.

In addition to the JMR (Form B) at 33kV metering location for each of the sub project included in the project activity, the following documents are also be provided to the DoE for verification:

1. JMR (Form B) at high voltage side of receiving sub-station (bulk meters: main and check).
2. Transmission loss calculation endorsed / confirmed jointly by the representatives of Wind World and the state utility.

The net electricity supplied to the grid can be cross checked from the invoices for each of the sub project raised on the state utility for supply of net electricity supplied to the grid.

Net electricity Supplied to Grid for the project activity is summation of Net electricity Supplied to Grid for each of the sub project included in the project activity.

The Project is operated and managed by Wind World (India) Ltd. The operational and management structure implemented by Wind World is as follows:

The detailed monitoring plan is described below:

- **Metering:** Electricity supplied to the grid is metered jointly by state utility and Wind World through dedicated main and check meters at 33 kV metering point for each of the sub project included in the project activity.

In addition to this there are main and check meters (Bulk meters) at high voltage side of receiving sub-station covering sub projects of the project activity and machines of other project developers. There are four receiving stations to which the sub projects included in the project activity are connected.

The schematic diagram shows location of meters for the project activity is attached as Appendix 1.

- **Metering Equipment:** Metering system for the project activity consists of main and check meters at 33kV metering point for each of the sub project included in the project activity and set(s) of main and check meters at high voltage side of receiving substation. All the meters are two-way trivector meters capable of recording import and export of electricity. The meters installed are capable of recording and storing half hourly readings of the electrical parameters for a maximum period of 35 days with digital output.

- **Meter Readings:** The electricity export and import to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from state Utility and Wind World (India) Ltd at 33kV metering point for each of the sub project included in the project activity. The Joint meter reading contains the value of energy imported, exported, transmission loss and the net electricity exported to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the state utility and by Wind World Officials. These certified readings are then used by the state utility to prepare the tariff invoices. Thus net electricity supplied to the grid for each of the sub project included in the project activity can be crosschecked with the value mentioned in the invoices raised on the state utility by each of the sub project included in the project activity

- **Inspection of Energy Meters:** All the main and check energy meters and all associated instruments, transformers installed at the Project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.

- **Meter Test Checking:** All the main and check meters are tested (and calibrated if found necessary) for accuracy on annual basis with reference to a portable standard meter. The portable standard meter is owned by KPTCL. The main and check meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy class. The consumption registered by the main meters alone hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits. All the meters are be tested / calibrated for accuracy annually.

If during the meter test checking,

- ☐ The main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.

- ☐ The main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.

- ☐ Both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the main meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied

to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter.

☐ If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2% accuracy class, all the meters shall be re-tested and calibrated immediately.

The schematic showing the location of meters for the project activity is given in Appendix 1.

Training and maintenance requirements:

Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the Wind Energy Converters (WECs), it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure, that Wind World's service staff is deft at handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. The Wind World Training Academy provides need-based training to meet the training requirements of Wind World projects. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees. This ultimately leads to creativity in problem solving.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	EF _{OM,y}
Unit:	tCO ₂ e/MWh
Description:	Operating Margin Emission Factor of Southern Electricity Grid
Source of data:	"CO ₂ Baseline Database for Indian Power Sector", version 1.1 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO ₂ Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied:	1.0038
Purpose of data:	Calculation of baseline emissions
Additional comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data / Parameter:	EF _{BM,y}
Unit:	tCO ₂ e/MWh
Description:	Build Margin Emission Factor of Southern Electricity Grid
Source of data:	"CO ₂ Baseline Database for Indian Power Sector", version 1.1 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO ₂ Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied:	0.718
Purpose of data:	Calculation of baseline emissions
Additional comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data / Parameter:	EF _{CM,y}
Unit:	tCO ₂ e/MWh
Description:	Combined Margin Emission Factor of Southern Electricity Grid

Source of data:	"CO ₂ Baseline Database for Indian Power Sector", version 1.1 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO ₂ Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied:	In case of wind power projects default weights of 0.75 for EF _{grid,OM,y} and 0.25 for EF _{grid,BM,y} are applicable as per ACM0002. Combined Margin Emission Factor (EF _{grid,CM,y}) = 0.93204
Purpose of data:	Calculation of baseline emissions
Additional comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Emission factor (EF_y) of the grid is calculated as a combined margin (CM) Combined margin (CM), calculated as the weighted average of the operating margin (OM) and build margin (BM) factor. In case of wind power projects default weights of 0.75 for EF_{OM} and 0.25 for EF_{BM} are applicable as per ACM0002.

$$EF_y = w_{OM} * EF_{OM,y} + w_{BM} * EF_{BM,y}$$

$$= 0.93204 \text{ tCO}_2\text{e/MWh}$$

D.2. Data and parameters monitored

Data / Parameter:	EG _y
Unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Project
Measured/ Calculated / Default:	Calculated
Source of data:	Electricity supplied to the grid as per Joint Meter Readings (Form B) taken at 33 kV metering point for each of the sub project included in the project activity.
Value(s) of monitored parameter:	Annual electricity supplied to the grid by the Project (EG _y) = 74466.081 MWh
Monitoring equipment:	Calculated as per formulas better described under section C.
Measuring/ Reading/ Recording frequency:	Monthly

Calculation method (if applicable):	Monitoring: All the meters are two-way trivector meters capable of recording import and export of electricity and provide output in the form of net electricity supplied to the grid. The procedures for metering and meter reading is as per the provisions of the power purchase agreement except or otherwise explicitly stated in the monitoring plan. Metering system for the project activity consists of dedicated main and check meters for each of the sub project owner included in the project activity at 33 kV metering location. In addition to this Joint meter readings are also noted at main and check meters (bulk meters) located at the substations. The subprojects included in the project activity are connected to following four substations:																																																														
	<table><tr><th>Sr. No.</th><th>Name of Customer</th><th>Capacity (MW)</th><th>Wind World Sub-station</th></tr><tr><td>1</td><td>Enercon Wind Farms (Chitradurga) Ltd.</td><td>8.8</td><td>Wind World Sub-station at Imangala</td></tr><tr><td>2</td><td>Steelfab Offshore</td><td>0.8</td><td rowspan="10">GIM-II Sub-station at Gownalli</td></tr><tr><td>3</td><td>Dewanchand Ramsaran</td><td>0.8</td></tr><tr><td>4</td><td>Elpro International</td><td>0.8</td></tr><tr><td>5</td><td>Gautam Ladkat</td><td>0.8</td></tr><tr><td>6</td><td>Sameer Ladkat</td><td>0.8</td></tr><tr><td>7</td><td>Panama Business Centre</td><td>1.6</td></tr><tr><td>8</td><td>Sameer Ladkat</td><td>1.6</td></tr><tr><td>9</td><td>Panama Infrastructure</td><td>1.6</td></tr><tr><td>10</td><td>MK Agrotech Private Ltd.</td><td>1.6</td></tr><tr><td>11</td><td>Srinivas Sirigeri</td><td>0.8</td></tr><tr><td>12</td><td>Dempo Industries</td><td>0.8</td><td rowspan="3">EP-II Sub-station at Nandana Hosuru</td></tr><tr><td>13</td><td>Power Link Systems Pvt. Ltd.</td><td>0.8</td></tr><tr><td>14</td><td>Desai Brothers</td><td>0.8</td></tr><tr><td>15</td><td>Siddganga Oil Extraction</td><td>1.6</td><td rowspan="4">Gadag Sub-station at Banikoppa</td></tr><tr><td>16</td><td>Abhilash Garments</td><td>0.8</td></tr><tr><td>17</td><td>Prasad Global Solution</td><td>1.6</td></tr><tr><td>18</td><td>Gangadhar Narsingdas Agarwal</td><td>4.0</td></tr></table>	Sr. No.	Name of Customer	Capacity (MW)	Wind World Sub-station	1	Enercon Wind Farms (Chitradurga) Ltd.	8.8	Wind World Sub-station at Imangala	2	Steelfab Offshore	0.8	GIM-II Sub-station at Gownalli	3	Dewanchand Ramsaran	0.8	4	Elpro International	0.8	5	Gautam Ladkat	0.8	6	Sameer Ladkat	0.8	7	Panama Business Centre	1.6	8	Sameer Ladkat	1.6	9	Panama Infrastructure	1.6	10	MK Agrotech Private Ltd.	1.6	11	Srinivas Sirigeri	0.8	12	Dempo Industries	0.8	EP-II Sub-station at Nandana Hosuru	13	Power Link Systems Pvt. Ltd.	0.8	14	Desai Brothers	0.8	15	Siddganga Oil Extraction	1.6	Gadag Sub-station at Banikoppa	16	Abhilash Garments	0.8	17	Prasad Global Solution	1.6	18	Gangadhar Narsingdas Agarwal	4.0
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	17	Prasad Global Solution	1.6																																																												
18	Gangadhar Narsingdas Agarwal	4.0																																																													
The bulk meters are connected to the machines of the project activity and the machines commissioned by the other project developers. Therefore in order to determine the electricity supplied to the grid by the project activity at high voltage side of the substation, the state utility applies the transmission loss between 33 kV metering point and meter reading noted at high voltage side of the receiving substation to the meter reading recorded at the 33 KV metering point. The transmission loss calculated by the state utility is endorsed / confirmed jointly by the representatives of Wind World and the state utility. The transmission loss applied to the project activity by the state utility is reflected in the JMR (Form B) recorded at 33kV metering point. Frequency of recording data: Monthly Recording: The values of electricity supplied to the grid are sourced from JMR for the sub projects at 33 kV metering point. Responsibility: Joint responsibility of Wind World and state utility. Refer section C for an illustration of the provisions for measurement methods.																																																															
QA/QC procedures:	Refer section C for an illustration of the provisions for QA/QC procedures.																																																														
Purpose of data:	Calculation of baseline emissions																																																														
Additional comment:	The data will be archived for crediting period + 2 years.																																																														

Data / Parameter:	EG _{Export}
Unit:	MWh (Mega-watt hour)

Description:	Electricity Export recorded at meters (main and check meters). All the subprojects included in the project activity have dedicated main and check meters at 33 kV metering point.
Measured/ Calculated / Default:	Measured at Main & Check Meters
Source of data:	Electricity Export recorded at meters (main and check meters). All the subprojects included in the project activity have dedicated main and check meters at 33 kV metering point.
Value(s) of monitored parameter:	75513.989 MWh
Monitoring equipment:	Accuracy Class-0.2 Serial Number of Main Meter: Refer Appendix III of the MR Serial Number of Check Meter: Refer Appendix III of the MR Calibration Frequency: Annually Date of Last Calibration: Refer Appendix III of the MR
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	NA
QA/QC procedures:	Refer section C for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of baseline emissions
Additional comment:	The data will be archived for crediting period + 2 years.

Data / Parameter:	EG _{import}
Unit:	MWh (Mega-watt hour)
Description:	Electricity Import recorded at meters (main and check meters). All the subprojects included in the project activity have dedicated main and check meters at 33 kV metering point.
Measured/ Calculated / Default:	Measured at Main & Check Meters.
Source of data:	Electricity import from the grid as per joint meter reading for each of the subproject taken at 33kV metering point.
Value(s) of monitored parameter:	110.184 X 1.15 = 126.712 MWh
Monitoring equipment:	Accuracy Class-0.2 Serial Number of Main Meter: Refer Appendix III of the MR Serial Number of Check Meter: Refer Appendix III of the MR Calibration Frequency: Annually Date of Last Calibration: Refer Appendix III of the MR
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	NA
QA/QC procedures:	Refer section C for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of baseline emissions
Additional comment:	The data will be archived for crediting period + 2 years.

Data / Parameter:	T_E
Unit:	MWh (Mega-watt hour)
Description:	Transmission loss for export between the metering location at 33 kV metering point and the high voltage side of the substation to which the subproject is connected.
Measured/ Calculated / Default:	Calculated as per the procedure mentioned in the PPA. Refer section C of the MR.
Source of data:	Transmission Loss for export is sourced from the joint meter reading (Form B) taken at 33kV metering point for all the sub projects included in the project activity.
Value(s) of monitored parameter:	921.196 MWh
Monitoring equipment:	Calculated as per formulas better described under section C.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Monitoring: Transmission loss between metering location at 33 kV and the metering location at receiving substation is applied to the meter reading taken at meters connected at 33 KV point for the project activity. The Substation is connected to the machines of the project activity and the machines commissioned by the other project owners. Therefore transmission loss is applied by the state utility as reflected in the JMR (Form B) taken at 33kV point for all the sub projects included in the project activity. The JMR is signed by the representatives of Wind World and the state utility. Refer section C of MR. Frequency of recording data: Monthly Recording: The value of transmission loss is sourced from JMR for all the subprojects at 33 kV metering point. Responsibility: Joint responsibility of Wind World and state utility
QA/QC procedures:	Refer section C for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of baseline emissions
Additional comment:	The data will be archived for crediting period + 2 years.

D.3. Implementation of sampling plan

>>

No sampling plan is followed by PP.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>>

The baseline emissions are to be calculated as follows:

$$BE_y = EG_y * EF_y$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

EG_y = Net electricity supplied to the grid in year y and is applied directly from JMR certified by state utility.

This value can also be cross checked from the invoice. (MWh/yr)

EF_y = CO₂ emission factor of the grid (932.04 tCO₂e/GWh fixed ex-ante).

Baseline Emission for the period (01/09/2011 to 30/09/2012)

$$= 74466.081 \text{ (MWh)} * 0.93204 \text{ (tCO}_2\text{/MWh)}$$

$$= 69,405 \text{ tCO}_2$$

E.2. Calculation of project emissions or actual net GHG removals by sinks

>>

The project activity is a renewable energy project which generates electricity using wind power and hence does not result in project emissions.

E.3. Calculation of leakage

>>

No leakage is considered from the project activity as per approved methodology ACM0002.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	69,405	0	0	69,405

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	98,661	69,405

E.6. Remarks on difference from estimated value in registered PDD

>>

The emission reduction has been calculated for 18 months under the present monitoring period, while in registered PDD the Emission Reductions are calculated for a year (12 months). Proportionate number of CERs for a period of eighteen months as per registered PDD comes out to be 98,661. However, actual number of CERs achieved in the present monitoring period is 69,405. This reflects a difference of 29.65% on the downside, which is due to the low PLF achieved by the project activity.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO ₂ e)	8,127	61,278

Appendix 1. Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Wind World (India) Ltd.
Street/P.O. Box	Veera Industrial Estate, Veera Desai Road, Andheri (W)
Building	A/9, Wind World Tower
City	Mumbai
State/Region	Maharashtra
Postcode	400053
Country	India
Telephone	+91-22-6692 4848
Fax	+91-22-6692 1175
E-mail	Yogesh.mehra@windworldindia.com
Website	www.windworldindia.com
Contact person	
Title	Managing Director
Salutation	Mr.
Last name	Mehra
Middle name	
First name	Yogesh
Department	Corporate
Mobile	+91-98200 40301
Direct fax	+91-22-6692 1175
Direct tel.	+91-22-6692 4848 Extn. 7111
Personal e-mail	Yogesh.mehra@windworldindia.com

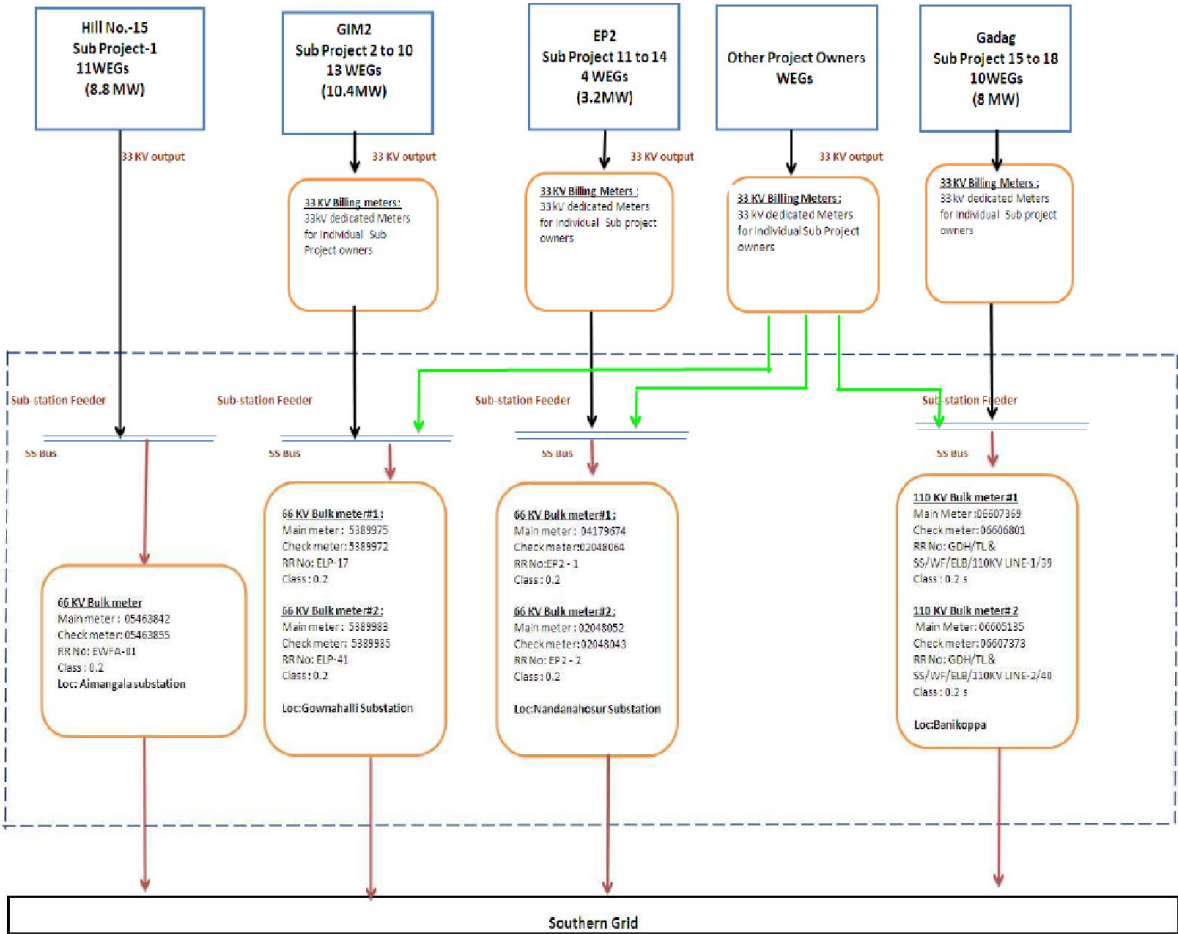
Document information

Version	Date	Description
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		

Annex I

Line Diagram Showing Relevant Metering Points



Annex II:

Net Electricity Exported to Grid (EGy)

Electricity Generation and CER Calculation

Month	Export[kWh]	Import[kWh]] @ 115%	Transmission Loss[kWh]	Net Electricity supplied to Grid[kWh]	Baseline Emission Factor (tCO ₂ e/MWh) EFy	Emission Reductions (tCO ₂ e) ERy
Oct-12	3569970.00	5244.00	38669.00	3526057.00	0.93204	3,286
Nov-12	2042557.08	8904.45	26632.00	2007020.63	0.93204	1,871
Dec-12	3226815.12	4143.04	35779.00	3186893.08	0.93204	2,970
Jan-13	2135851.92	9390.07	28050.00	2098411.85	0.93204	1,956
Feb-13	2250431.10	9458.66	24976.00	2215996.44	0.93204	2,065
Mar-13	2061778.38	17709.06	31707.61	2012361.71	0.93204	1,876
Apr-13	2711731.44	12911.14	37690.00	2661130.30	0.93204	2,480
May-13	5272141.08	6456.12	62718.00	5202966.96	0.93204	4,849
Jun-13	10354178.58	2175.23	120826.00	10231177.36	0.93204	9,536
Jul-13	12028158.90	2657.40	155692.00	11869809.50	0.93204	11,063
Aug-13	8725269.78	1035.28	100866.00	8623368.50	0.93204	8,037
Sep-13	4614577.14	6627.04	49740.00	4558210.10	0.93204	4,248
Oct-13	3654073.92	6004.79	41195.00	3606874.13	0.93204	3,362
Nov-13	2675822.88	2933.40	30509.00	2642380.48	0.93204	2,463
Dec-13	3319685.88	3002.40	40632.00	3276051.48	0.93204	3,053
Jan-14	2970727.62	4073.07	39025.00	2927629.55	0.93204	2,729
Feb-14	1737505.44	12044.99	27910.00	1697550.46	0.93204	1,582
Mar-14	2162713.14	11941.83	28579.45	2122191.86	0.93204	1,978
Total	75513989	126712	921196	74466081	Total CERs	69,405

Appendix III

Metering system details:

The details of meters installed at the substation are provided below:

Project Owner	RR No.	Site	District	Meter Type	Meter Sr. No.	Accuracy Class	Make	Latest Calibration Done			
Enercon Wind Farms (Chitradurga) Ltd.	EWFA-01	Hill No-15	Chitradurga	Main Meter	5463842	0.2	L & T		11-06-2012	27-02-2013	28-10-2013
				Check meter	5463855	0.2	L & T		11-06-2012	27-02-2013	28-10-2013
Desai Brothers	EP2-25	EP-II	Chitradurga	Main Meter	5437948	0.2	L & T	26-12-2011	26-12-2012	22-03-2013	09-01-2014
				Check meter	5463853	0.2	L & T	26-12-2011	26-12-2012	22-03-2013	09-01-2014
Dempo Industries	EP2-27	EP-II	Chitradurga	Main Meter	5463847	0.2	L & T	26-12-2011	28-12-2012	22-03-2013	10-01-2014
				Check meter	5463838	0.2	L & T	26-12-2011	28-12-2012	22-03-2013	10-01-2014
Power Link System Private Limited	EP2-28	EP-II	Chitradurga	Main Meter	5437934	0.2	L & T	26-12-2011	28-12-2012	22-03-2013	10-01-2014
				Check meter	5462964	0.2	L & T	26-12-2011	28-12-2012	22-03-2013	10-01-2014
Srinivas Sirigeri	EP2-29	EP-II	Chitradurga	Main Meter	5463840	0.2	L & T	26-12-2011	28-12-2012	22-03-2013	10-01-2014
				Check meter	5462963	0.2	L & T	26-12-2011	28-12-2012	22-03-2013	10-01-2014
Panama Infrastructure	ELP-23	GIM-II	Chitradurga	Main Meter	5389981 5390229 ¹	0.2	L & T		15-05-2012	21-02-2013	24-05-2013
				Check meter	5271055	0.2	L & T		15-05-2012	21-02-2013	24-05-2013
Sameer Ladkat	ELP-24	GIM-II	Chitradurga	Main Meter	07022973	0.2	L & T		21-02-2012	21-02-2013	24-05-2013
				Check	07022907	0.2	L & T		21-02-2012	21-02-2013	24-05-2013

¹ Old Meter 5389981 has been changed on 13/06/2011, although in the Calibration Report, old meter is mentioned which is typological error from calibration authority end.

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				meter							
Elpro International	ELP-29	GIM-II	Chitradurga	Main Meter	5436130	0.2	L & T		15-05-2012	21-02-2013	24-05-2013
				Check meter	5436135	0.2	L & T		15-05-2012	21-02-2013	24-05-2013
MK Agrotech Private Ltd	ELP-31	GIM-II	Chitradurga	Main Meter	5389904	0.2	L & T		15-05-2012	21-02-2013	24-05-2013
				Check meter	5386140	0.2	L & T		15-05-2012	21-02-2013	24-05-2013
Panama Business Centre	ELP-33	GIM-II	Chitradurga	Main Meter	8001400	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
				Check meter	5390230	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
Sameer Ladkat	ELP-34	GIM-II	Chitradurga	Main Meter	5390421	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
				Check meter	5341085	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
Gautam Ladkat	ELP-35	GIM-II	Chitradurga	Main Meter	5389971	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
				Check meter	5389974	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
Steelfab Offshore	ELP-37	GIM-II	Chitradurga	Main Meter	5437939	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
				Check meter	5437956	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
Dewanchand Ramsaran	ELP-38	GIM-II	Chitradurga	Main Meter	5389379	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
				Check meter	5389378	0.2	L & T		15-05-2012	21-03-2013	31-05-2013
Abhilash Garments & Estates (P) Ltd.	GDG/TL & SS/WF/AGEM/Loc No-11/46	Gadag	Gadag	Main Meter	5463841	0.2	L & T		26-11-2011	09-05-2013	
				Check meter	6760772	0.2	L & T		26-11-2011	09-05-2013	
Prasad Global Solutions	GDG/TL & SS/WF/PGSM/Loc No-1/41	Gadag	Gadag	Main Meter	6607372	0.2	L & T		25-01-2012	09-05-2013	
				Check meter	5389381	0.2	L & T		25-01-2012	09-05-2013	
Prasad Global Solutions	GDG/TL & SS/WF/PGSR/Loc No-17/50	Gadag	Gadag	Main Meter	6675385	0.2	L & T		26-11-2011	15-06-2013	
				Check	6675392	0.2	L & T		26-11-2011	15-06-2013	

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				meter							
Gangadhar Narsingdas Agarwal	GDG/TL & SS/WF/GNAM/Loc No-12 & 13/47	Gadag	Gadag	Main Meter	6675414	0.2	L & T		26-11-2011	31-07-2014	
				Check meter	6675384	0.2	L & T		26-11-2011	31-07-2014	
Gangadhar Narsingdas Agarwal	GDG/TL & SS/WF/GNAM/Loc No-6,7 & 8/45	Gadag	Gadag	Main Meter	6675390	0.2	L & T		25-01-2012	31-07-2014	
				Check meter	6760764	0.2	L & T		25-01-2012	31-07-2014	
Siddaganga Oil Extractions Ltd.	GDG/TL & SS/WF/GNAM/Loc No 14 & 15/48	Gadag	Gadag	Main Meter	5463849	0.2	L & T		26-11-2011	31-07-2014	
				Check meter	6605127	0.2	L & T		26-11-2011	31-07-2014	

S. No.	Name of Substation	Meter RR No.	Main Meter	Check Meter	Calibration Certificate		
					2012	2013	2014
1	Wind World Sub-station at Imangala	EWFA-01	05463842	05463855	11-Jun-12	27-Feb-13 28-Oct-13	
2	EP-II Sub-station at Nandana Hosuru	EP2-01	03097652 ²	02048064	15-Sep-12	28-Mar-13	22-Sep-14
		EP2-02	02048052	02048043	06-Mar-12	28-Mar-13	22-Sep-14
3	GIM-II Sub-station at Gownalli	ELP-17	05271046	05389972	13-Jun-12	20-Mar-13	23-Jul-14
		ELP-41	05389983	05389985	13-Jun-12	20-Mar-13	23-Jul-14
4	Gadag Sub-station at Banikoppa	Line I (GDG/TL&SS/WF/ELB/110LINE-I/39)	06607369	06606801	14-Jul-11 22-Oct-12	25-Jul-13	
		Line II (GDG/TL&SS/WF/ELB/110LINE-II/39)	06605135	06607373	25-Sep-12	25-Jul-13	

² Old meter: 04179674 has been replaced on 15/09/2012.